imaginary roots occur in conjugate pairs, and since the product of any two conjugate imaginaries is a positive real number, the sign of the product of the n n^{th} roots of 1 when n is odd, is $+$; and when n is even, $-$.

Furthermore, since the successive powers of the first imaginary root of 1, from the 1st to the n^{th}, give us all the n^{th} roots of 1, therefore, if we denote the first imaginary root by ω, we shall have as the product of the n n^{th} roots, $\omega.\omega^2.\omega^3\ldots\ldots\omega^n=\omega^{n\frac{n+1}{2}}$. But $\omega^n=1$. $\therefore$ $\omega^{n\frac{n+1}{2}}=+1$ when n is odd; and ±1, when n is even. But of these last two signs, $-$ must be chosen, for reasons assigned in the preceding paragraph.

II. That the theorem is true in general for the n n^{th} roots of m, is made evident when we remember that the n n^{th} roots of any number may be found by multiplying any one of the n^{th} roots of such number by the different n^{th} roots of 1. For then, we would have $m^{\frac{1}{n}}\times\omega.m^{\frac{1}{n}}\times\omega^2\ldots\ldots m^{\frac{1}{n}}.\omega^n=m\omega^{n\frac{n+1}{2}}=+m$ or $-m$, according as n is odd or even, as shown above.

Also solved by *COOPER D. SCHMITT.*

ERRATA. In numerator of the expression, in next to last line, on page 115 of last issue, for "Ra" read $\frac{Ra}{r'}$; on page 117, line 4, for "$s(s-2a_2)$" read $s(s-2a_3)$; and in "Errata," for "last issue" read February issues. Also problems numbered 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, should be Nos. 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, respectively.

PROBLEMS.

68. Proposed by ROBERT J. ALEY, A. M., Professor of Mathematics in Indiana University, Bloomington, Indiana.

Sum to n terms the series, $n\cos\theta+(n-1)\cos2\theta+(n-2)\cos3\theta+$, etc.

[*Chrystal's Algebra.*]

69. Proposed by Prof. C. E. WHITE, A. M., Trafalgar, Indiana.

Prove that $x^n\pm x^{n-1}+x^{n-2}\pm\ldots\ldots+(\pm1)^{n-1}x+(\pm1)^n=(x\mp1)^n\pm A(x\mp1)^{n-1}+B(x\mp1)^{n-2}\pm\ldots\ldots+(\pm1)^n x$, where A, B, C, ...are the binomial coefficients of the $(n+1)^{th}$ order.